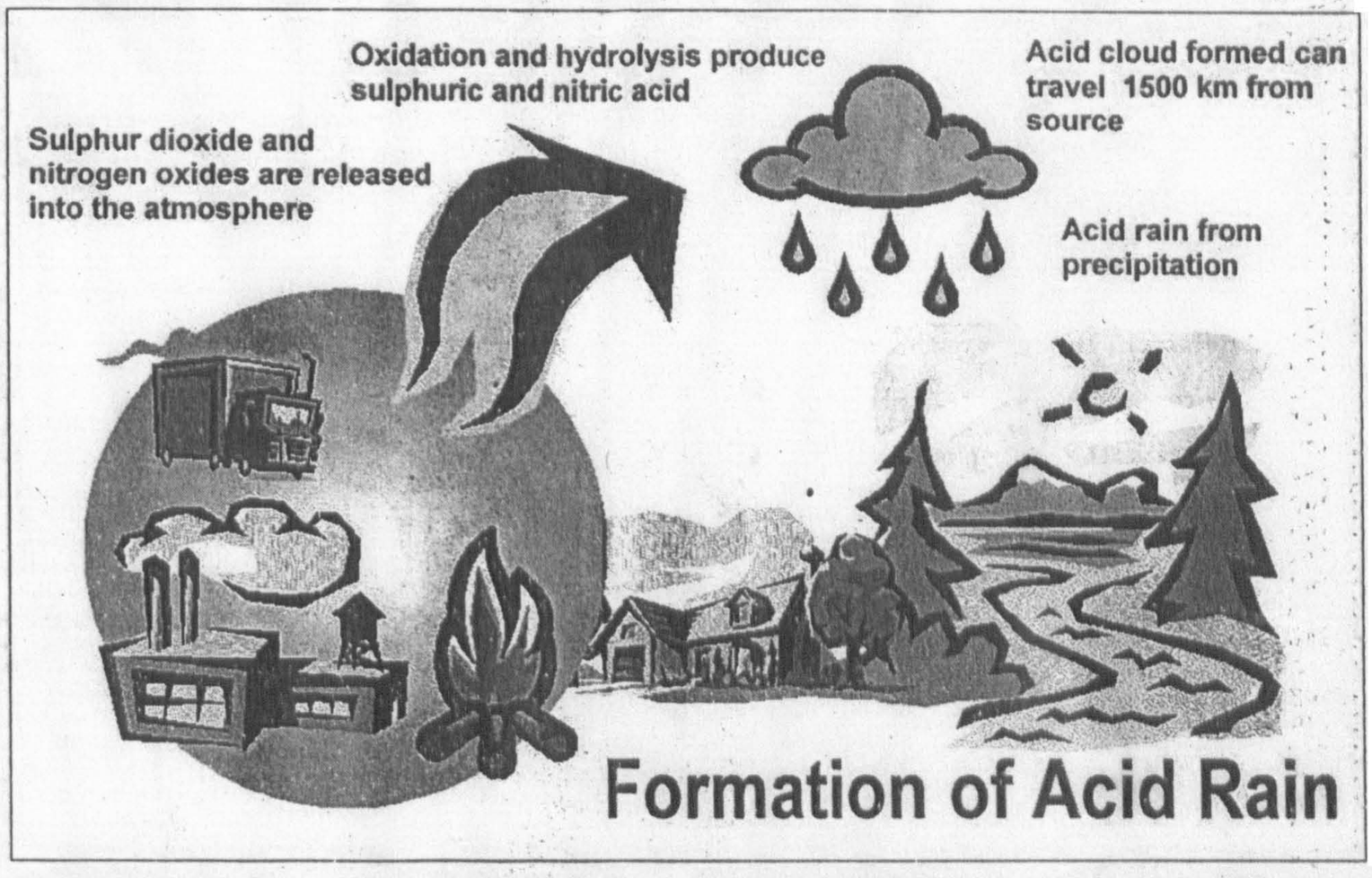
Acid rain: an imagination of disaster versus scientific reality

By Professor Ghazally Ismail, deputy vice chancellor of UNIMAS and professor of immunology



Formation of Acid Rain

A series of critical environmental problems have surfaced in Sarawak in just these last few months. First, it was the ragingly fatal epidemic of Coxsackie virus killing about two dozens innocent young children to remind us of the unhygienic environment some of us have been exposed to. Then came the worst ever air pollution experienced in the state when the API hit more than 800 resulting in the haze emergency being declared. As if these were not enough, news of our water supply being contaminated sent thousands of Sarawak urbanites scurrying to the supermarkets to snatch the last on the few remaining bottles of mineral water off the shelves. Alas here is another one! Now there is a new environmental catastrophe that has in the last few days so captured the Sarawak public's imagination – and sparked so much fear – the acid rain with its host of deadly consequences? While we acknowledge that there are problems of pollution and other environmental assaults in Sarawak in the aftermath of the haze disaster, we also believe that it is wrong to exaggerate the seriousness of the environmental ills. Sadly though, in the past few days, environmental extremists, scare-mongering journalists, media-conscious scientists and the likes had taken positions to warn the public of the formation of acid rain amidst us and the hazards it poses to our health, properties and environment. Here I felt compelled to caution ourselves that while such good intentions are laudable, we also need scientific facts. Unless the claims of adverse effects brought about by acid rain are based on a solid body of established scientific facts, widely accepted perceptions may be faulty. Why so? Allow me to review the widely perceived claims and scientific evidence that still clouds the issue of acid rain as an environmental catastrophe with the hope that it can help us make our own informed decision on this currently debated issue.

It was an English man, Angus Smith, who coined the phrase *acid rain* in 1872. Since then, acid rain has been regarded as a scourge, an unpleasant and destructive by-product of industrialisation. As electric power plants and industrial plants burn coal or oil, they emit large amounts of sulphur dioxide, suspended particulate matter and nitrogen oxides. As these gases are transported long distances by winds, they form secondary pollutants such as nitric acid vapour and droplets containing solutions of sulphuric acid which eventually descend to Earth's surface in wet form as acid rain. Other contributions to acid rain come from emissions of nitric oxide from great numbers of automobiles in large urban areas. Natural rain varies in acidity, with an average pH of 5.0 to 5.6. Acid rain, especially when the pH falls below 5.1, has been blamed for a number of harmful effects. In the 1970s, environmentalists in the United States claimed that acid rain had caused thousands of lakes to be devoid of life, with thousands more doomed to become fishless. No evidence was cited to support this position. In 1981, the National Research Council USA forecast that the number of acidified lakes would double by 1990. This has not happened. In Asia, acid rain was claimed to already be having far-reaching effects, damaging India's Taj Mahal, corroding metal and concrete structures in China and killing rice and wheat crops in some agricultural areas. For all these claims of disaster from acid rain, there was no scientific assessment on which to base them.

Despite the uncertainties and paucity of good scientific backing, President Carter's Council of Environmental Quality issued a report calling acid rain "one of the most serious environmental problem of the century." By 1980, the US Congress responded to all this hype by authorising a 10-year US$500 million study, which became known as the National Acid Precipitation Assessment Project (NAPAP). Its purpose was to determine once and for all the effect of acid rain on the natural environment. Utilising the talents of nearly 700 of the nation's top scientists in aquatic, soil, atmospheric, and related sciences and ultimately costing US$537 million, the 28-volume report was completed by 1990. The report, issued after 10 years of study, concluded " that acid rain should be viewed as a long-term problem, requiring pollution controls, but is not the environmental crisis some scientists have suggested." The NAPAP study also found that, contrary to all the specious reports of "dying forests," acid rain has little or no deleterious effect on forest health. In fact many species depend upon acidic soil for survival. Even more interesting, NAPAP studies found that the nitrogen and sulphur that characterises acid rain really acts as nutrients, essential for plant growths. The same result was found in Sweden where the principal effect of acid rain is the improvement of crop yields and crop protein content. NAPAP also found no evidence that acid rain had caused measurable human health problems. So really, despite the acid rain been referred to as "poison falling out of the sky, killing our forests and ravaging the countryside", we are actually in far better shape than we have been led to believe. I am fully aware that in taking this approach of presenting the uncertainties in science, I run the risk of being accused as "anti-environment." That would be wrong. I merely believe that any contentious environmental problem should be proved to be real before we lavish money on them.

Good intentions are not enough in developing public policies; we need scientific facts. Good stewardship of the environment can only result from scientific honesty and straightforward analysis. At this point and time, I am reminded by the words of a very prominent naturalist and environmentalist in Harvard University Dr Edward O. Wilson who once said: "Science remains our best hope for the future because it is such a potent force in marsalling effective action. When scientific evidence is unassailable, political action is unavoidable."

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